

## **EFFICIENT PERCEPTUAL/PHYSICAL COLOR SPACE CONVERSION**

### **ABSTRACT OF THE DISCLOSURE**

An imaging or other sensory reproduction system efficiently converts image or other  
5 sensory data between a perceptual color space (e.g., the sRGB color space) and a physical  
color space (unity gamma) or other perceptual/physical sensory models that are related by an  
expression involving a computationally expensive exponential function. The imaging  
system calculates exponential functions that can be composed from computationally  
inexpensive operations, such as square root, square, reciprocal, as well as multiplications  
10 and/or additions and subtractions. These computationally less expensive functions are then  
combined, such as in a weighted and/or offset mean, summation or difference to  
approximate the computationally expensive exponential function. The imaging system  
evaluates the expression using the approximation to efficiently yield the converted image  
data. The efficient conversion between perceptual and physical color spaces allows  
15 operations, such as blending and anti-aliasing, to be performed in the physical color space  
before display of a perceptual color space image.